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09/638,245	08/14/2000	Christopher M. Hanna	56233-139(THAT-3DVCN0	1379

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McDermott Will & Emery
600 13th Street, NW
Washington, DC 20005-3096

EXAMINER	
LEE, PING	

ART UNIT	PAPER NUMBER
2614	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mweipdocket@mwe.com

Office Action Summary	Application No.	Applicant(s)	
	09/638,245	HANNA, CHRISTOPHER M.	
	Examiner	Art Unit	
	Ping Lee	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60-93,104-106,109,110,112-119 and 121-133* is/are pending in the application.

4a) Of the above claim(s) *118,121-127,132 and 133* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60-93,104-106,109,110,112-117,119 and 128-131* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 121-127 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 121-127 specify a digital adaptive signal weighting system with details, such as a first digital filter section and a second digital filter section as claimed, that are not presented in the claims that have been examined in the office action mailed on 7/24/09. Further, claims 121-127 define an invention which corresponds to claims 7-9 and 49-59 which have been withdrawn from consideration in the last office action as being non-elected claims. It is noted that applicant has canceled claims 7-9 and 49-59 in the current amendment. Claims 132, 118 and 133 are substantially similar to claims 107 and 108 which have been withdrawn from consideration in the last office action mailed on 7/24/09 as being non-elected claims. It is noted that applicant has canceled claims 107 and 108 in the current amendment.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 121-127 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 104 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The newly amended claim 14 includes a newly added limitation "wherein the adaptive signal weighting system is configured to vary the amplitude of substantially all the spectrum within the digital difference signal responsive to the amplitude of substantially all the spectrum within the digital difference signal". This newly added limitation has not been disclosed in the specification as originally filed.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 69-71, 82-84, 86, 87, 89-93, 109, 110, 112-115 and 119 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art as illustrated in Fig. 1 (hereafter APA) in view of Holt et al. (hereafter Holt) (US 4,803,727).

Regarding claims 87, 69, 86, 89, 92, 109, 110 and 112-114, APA illustrated a stereophonic encoder to transmit left and right stereophonic signals by separately processing a sum signal in a L+R path and a difference signal in a L-R path. Although

not explicitly shown in Fig. 1, one skilled in the art would have expected that the encoded sum signal and the difference signal could be reconstructed at the decoder at the receiving end to yield a left signal and a right signal, or a monophonic signal. The APA illustrated in Fig. 1 was implemented using analog circuitry in accordance with the standard defined by BTSC. However, Fig. 1 fails to show how to implement the encoder by using digital circuitry.

Holt teaches a similar encoder also including a L+R path and a L-R path to transmit L and R stereophonic signal to a receiver having a decoder (to reconstruct) to obtain left and right signals (applied to the left and right speakers). Furthermore, Holt teaches that any difference in phase during transmitting between these two paths will result in loss of stereophonic information (col. 1, lines 33-35). To prevent a mismatch, Holt proposes inserting delay equalization in the paths and to use digital processing for effecting overall processing and delay to avoid the difficulties of matching delays using analog processors. Holt teaches that it is easy to design digital filters providing the precise delay control without corrupting the signals (col. 3, lines 28-41). Accordingly, one of ordinary skill in the art at the time of the invention was made, with APA and Holt before him/her, would have been motivated to ensure that the signals in L+R and L-R paths are matched, so the stereo relationship between the left and right signals are maintained at the receiver end. Moreover, one of ordinary skill in the art at the time of the invention was made, with APA and Holt before him/her, would have been motivated to embody the analog filters in APA using digital technology, which allows a designer greater ability to equalize the delays between multiple paths.

The limitation that "the BTSC encoder has a frequency response in the digital domain that is substantially equal to the analog frequency response specified by the BTSC standard" or the limitation that "the difference between the summation signal and the difference signal, for a given frequency and level, conforms with the difference specified by the BTSC standard" or similar claimed limitation is inherently met by modified APA using digital technology because the digital BTSC encoder has to meet the standard set by the analog frequency response specified by the BTSC standard.

Regarding claims 69-71, 82-84, 86, 89, 91, 92, 109, 112-114 and 119, Holt fails to show an analog-to-digital converter arrangement. Nevertheless, Holt teaches an ADC arrangement with a difference sequence. In Holt, the left and right signals form the sum and difference first, and then they are converted to digital signals (by 11, 12). So the digital sum and digital difference signals are encoded for transmission of the stereophonic source signal. With a digital stereophonic input source, the input could be directly applied to the digital matrix without any A/D converters. With analog stereophonic input source, one skilled in the art could utilize any well-known ADC to convert the analog signals (analog L and R) to digital signals (digital L and R) to be applied to the digital matrix to obtain the digital sum signal and the digital difference signal. So the signals (sum and difference signals), used for encoding the stereophonic sound source, after the digital matrix are the same as Holt. Thus, it would have been obvious to one of ordinary skill in the art to modify APA and Holt by converting the analog source signals (L and R) to digital formats, so that the matrix could be implemented by digital circuitry. The claimed 75 μs preemphasis is inherently included

according to BTSC standard. The claimed "digital signal processor" could be interpreted as a circuit for processing digital signal.

Regarding claim 90, APA and Holt fail to show that the digital matrix unit, the difference channel processing unit, and the sum channel processing unit are included in a single integrated circuit. When an engineer designs a system, the size of the system is a very important factor to be considered due to the cost of manufacturing, shipping, weight, and overall appearance of the product. With the advanced technology, the size of an electronic circuit, in general, has reduced dramatically. Thus, it would have been obvious to one of ordinary skill in the art to modify APA and Holt to try to placing the digital matrix unit, the difference channel processing unit, and the sum channel processing unit in a single integrated circuit in order to reduce the cost of the system and make a smaller system.

Regarding claims 92, 93 and 115, APA fails to show a digital modulator unit. Examiner takes Official Notice that a digital modulator is notoriously well known in the art. Of course, in accordance with BTSC, the carrier frequency for the difference signal has to be set at 31 kHz. Thus, one of ordinary skill in the art would be motivated to using a well known digital modulator for modulating the digital sum and digital difference signal in order to combine these signals into a single transmitting signal.

Regarding claim 71, the claimed "preselected sample rate" is inherently included in a digital signal.

6. Claims 60-68, 72-77 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art as illustrated in Fig. 1 (hereafter APA) in

view of Holt et al. (hereafter Holt) (US 4,803,727) and Crochiere et al. (hereafter Crochiere) ("Interpolation and Decimation of Digital Signals - A Tutorial Review").

Regarding claims 60, 72, 74 and 88, APA illustrated a stereophonic encoder to transmit left and right stereophonic signals by separately processing a sum signal in a L+R path and a difference signal in a L-R path. Although not explicitly shown in Fig. 1, one skilled in the art would have expected that the encoded sum signal and the difference signal could be reconstructed at the decoder at the receiving end to yield a left signal and a right signal, or a monophonic signal. The APA illustrated in Fig. 1 was implemented using analog circuitry in accordance with the standard defined by BTSC. However, Fig. 1 fails to show how to implement the encoder by using digital circuitry.

Holt teaches a similar encoder also including a L+R path and a L-R path to transmit L and R stereophonic signal to a receiver having a decoder (to reconstruct) to obtain left and right signals (applied to the left and right speakers). Furthermore, Holt teaches that any difference in phase during transmitting between these two paths will result in loss of stereophonic information (col. 1, lines 33-35). To prevent a mismatch, Holt proposes inserting delay equalization in the paths and to use digital processing for effecting overall processing and delay to avoid the difficulties of matching delays using analog processors. Holt teaches that it is easy to design digital filters providing the precise delay control without corrupting the signals (col. 3, lines 28-41). Accordingly, one of ordinary skill in the art at the time of the invention was made, with APA and Holt before him/her, would have been motivated to ensure that the signals in L+R and L-R paths are matched, so the stereo relationship between the left and right signals are

maintained at the receiver end. Moreover, one of ordinary skill in the art at the time of the invention was made, with APA and Holt before him/her, would have been motivated to embody the analog filters in APA using digital technology, which allows a designer greater ability to equalize the delays between multiple paths.

Regarding claims 60-68, 72, 76 and 77, Holt also fails to show an analog-to-digital converter arrangement. However, Holt teaches that the left and right signals forming the sum and difference first, and then convert to digital signals (by 11, 12). So the digital sum and digital difference signals are encoded for transmission of the stereophonic source signal. With a digital stereophonic input source, the input could be directly applied to the digital matrix without any A/D converters. With analog stereophonic input source, one skilled in the art could utilize any well-known ADC to convert the analog signals (analog L and R) to digital signals (digital L and R) to be applied to the digital matrix to obtain the digital sum signal and the digital difference signal. So the signals (sum and difference signals), used for encoding the stereophonic sound source, after the digital matrix are the same as Holt. Thus, it would have been obvious to one of ordinary skill in the art to modify APA and Holt by converting the analog source signals (L and R) to digital formats, so that the matrix could be implemented by digital circuitry.

APA and Holt also fail to show a first up-sampler configured to insert additional samples into the summations signal to increase the sample rate of the summation signal and a second up-sampler configured to insert additional samples into the difference signal to increase the sample rate of the difference signal. According to

Crochiere, the sampling rate is a fundamental consideration of digital signal processing techniques and applications. It determines the convenience, efficiency, and/or accuracy in which the digital signal processing can be performed. The sampling rate can be and should be converted to a different one so the resulting signal corresponding to the same analog function or to convert rate in the system from one rate to another when performing different parts of processing algorithm at different sampling rates (second column of p. 300 and abstract). When the rate needs to increase, Crochiere teaches using interpolation. When the rate needs to decrease, Crochiere teaches using decimation. The analog circuit as shown in APA involves many signal processing steps. Specifically, the sum signal and the difference signal are processed separately and fundamentally differently. Thus, with APA, Holt and Crochiere in front of him/her, it would have been obvious to one of ordinary skill in the art to combine them to form a digital BTSC encoder with necessary interpolator and/or decimator in order to ensure that the digital BTSC encoder will generate a signal that corresponds to the analog signal according to the analog BTSC encoder and the digital BTSC encoder would produce signal with accurate data with great efficiency.

The claimed 75 μs preemphasis is inherently included according to BTSC standard. The claimed "digital signal processor" could also be interpreted as a circuit for processing digital signal.

Regarding claims 62, 66 and 75, the claimed "preselected sample rate" is inherently included in a digital signal.

7. Claims 78-81,85, 104-106, 116, 117 and 128-131 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Holt as applied to claims 82 and 87 above, and further in view of Walker et al. (hereafter Walker) (US 4,809,274).

Regarding claims 78, 80, 85, 104, 105, 106, 116, 117, as indicated above, APA uses analog device for encoding the sum and difference signals, so the compression is also performed by analog device. Both the APA and Holt fail to show an adaptive weighting system. Walker teaches a digital compander transmitting digital audio signal (col. 1, line 17). Walker suggests an adaptive weighting system to correct errors included by the compression and expansion processes (col. 1, lines 56-58). Accordingly, one of ordinary skill in the art at the time of the invention was made, with all three references before him/her, would have been motivated to use an adaptive weighting system for performing the compression as required by BTSC in order to transmit the stereophonic source to the receiver without incurring error.

Since the stereophonic source is intended to be broadcast as a TV signal in accordance with BTSC, the digital output signal from L-R path and the digital output signal from L+R path could be converted to analog format, so they would be modulated by the carrier in accordance with BTSC; or the digital output signal from L-R path and the digital output signal from L+R path could be modulated by the carrier and then converted to analog signal to be transmitted as a TV broadcast signal. One skilled in the art would be motivated to design the encoder using either method since they produce similar TV broadcast signal.

Regarding claims 79 and 81, the claimed 75 μs preemphasis is inherently included according to BTSC standard.

Regarding claims 128-131, the claimed limitations state the functions of the adaptive weighting system. Those functions are the requirement of BTSC standard. Thus, the combination of APA, Holt and Walker would meet the claimed functions.

Response to Arguments

8. Applicant's arguments with respect to claims 60-68, 72-77 and 88 have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's arguments filed 2/11/10 for claims 69-71, 82-84, 86, 87, 89-93, 109, 110, 112-114 and 119 have been fully considered but they are not persuasive.

Actually, applicant fails to provide any argument for the above listed claims. The first and second up-samplers being stated in argument are for claims 60-68, 72-77 and 88.

The limitation in claim 104 raises issue of new matter.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522. The examiner can normally be reached on Wednesday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ping Lee/
Primary Examiner, Art Unit 2614

pwl